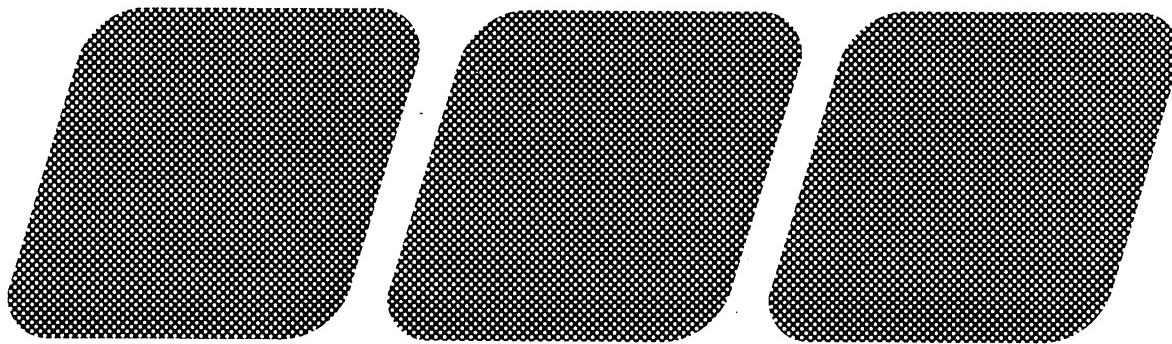
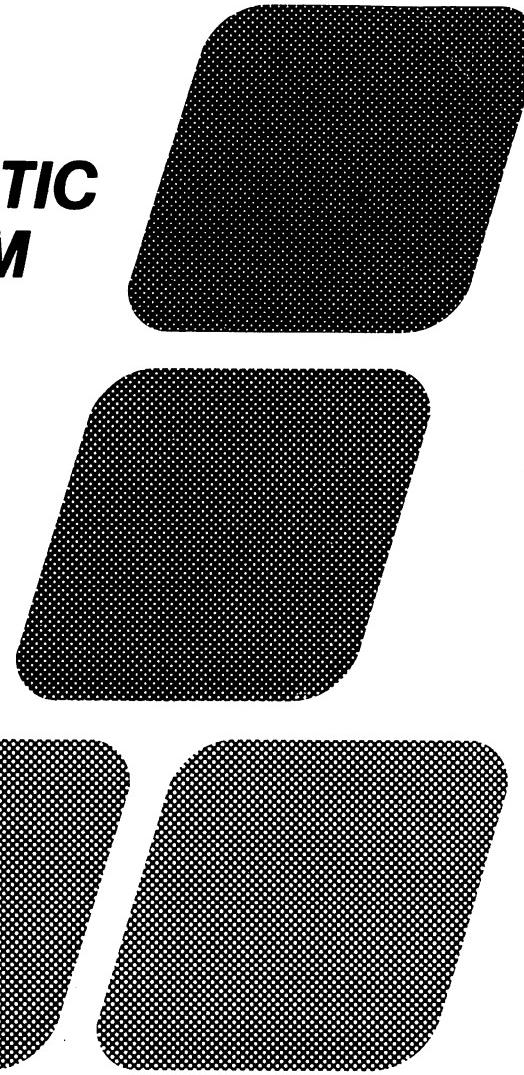


**SCHEMATIC  
DIAGRAM**

**CRUMAR<sub>®</sub>**  
*Musical Instruments*



*mod.*  
**Spirit**

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## **SCHEMATIC DIAGRAM**



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**FEMALE CONNECTOR SYMBOL (es.J 2/1)**



**PLUG IN CONNECTOR SYMBOL**



**WIRE SOLDERING POINT**



**TEST POINT ( T P... )**



**CONNECTING POINT (ON p.c.b.)**



**METALLIC FILM RESISTOR 1%**

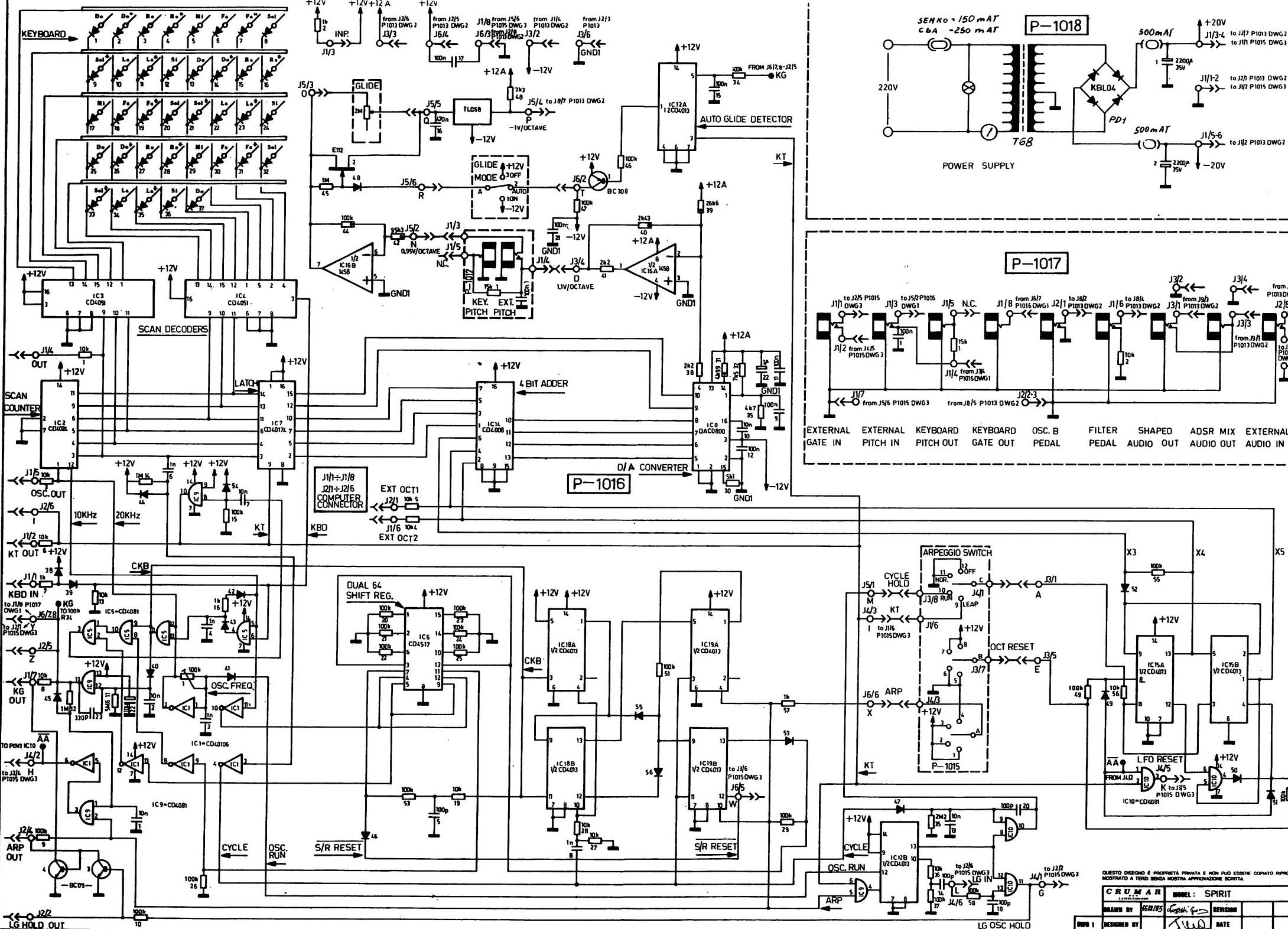
**ALL resistors 1/4w unless otherwise indicated**

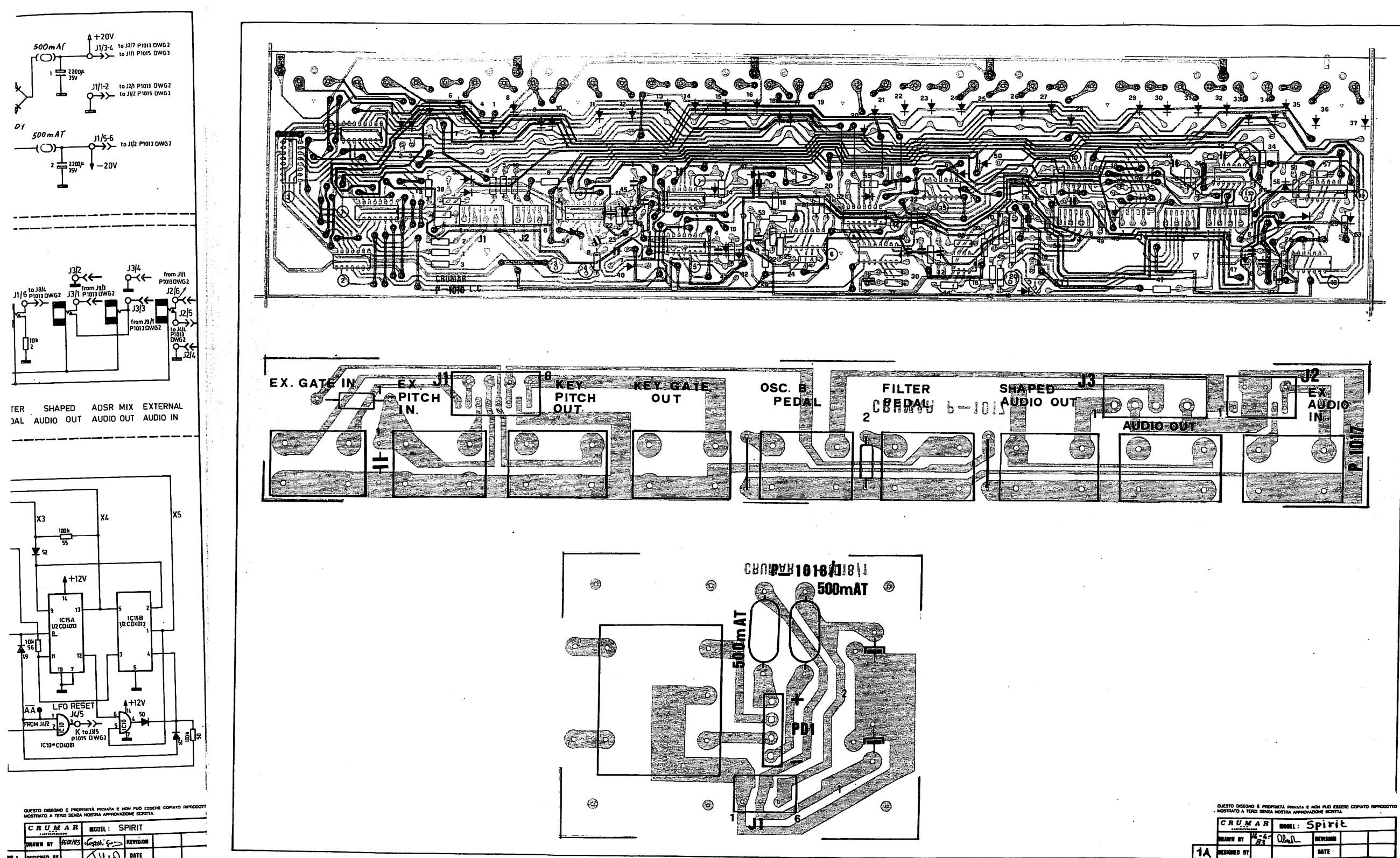
**ALL tabs switches shown in OFF position**

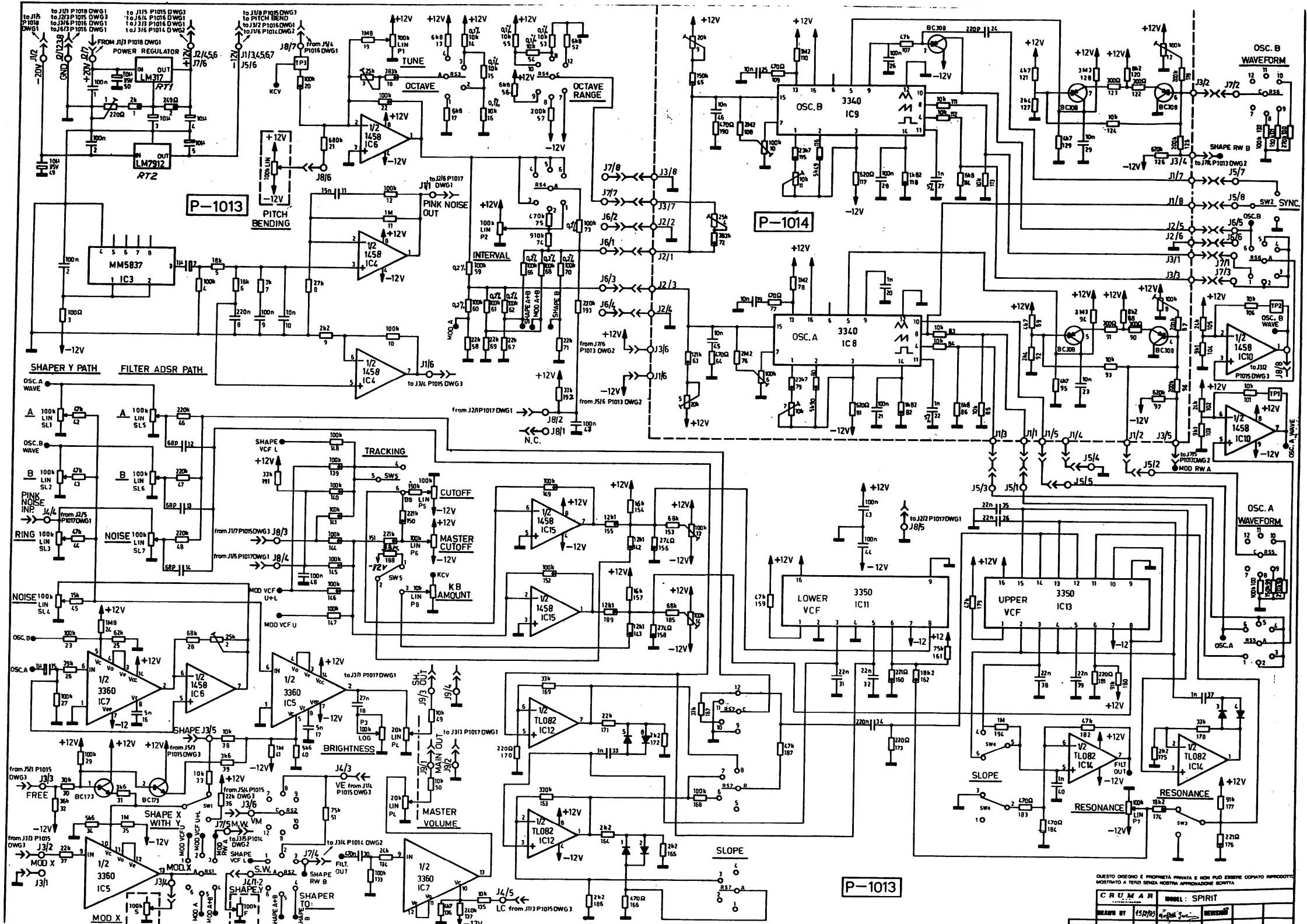
**ALL key switches shown in OFF position**

**See part list for component part numbers**

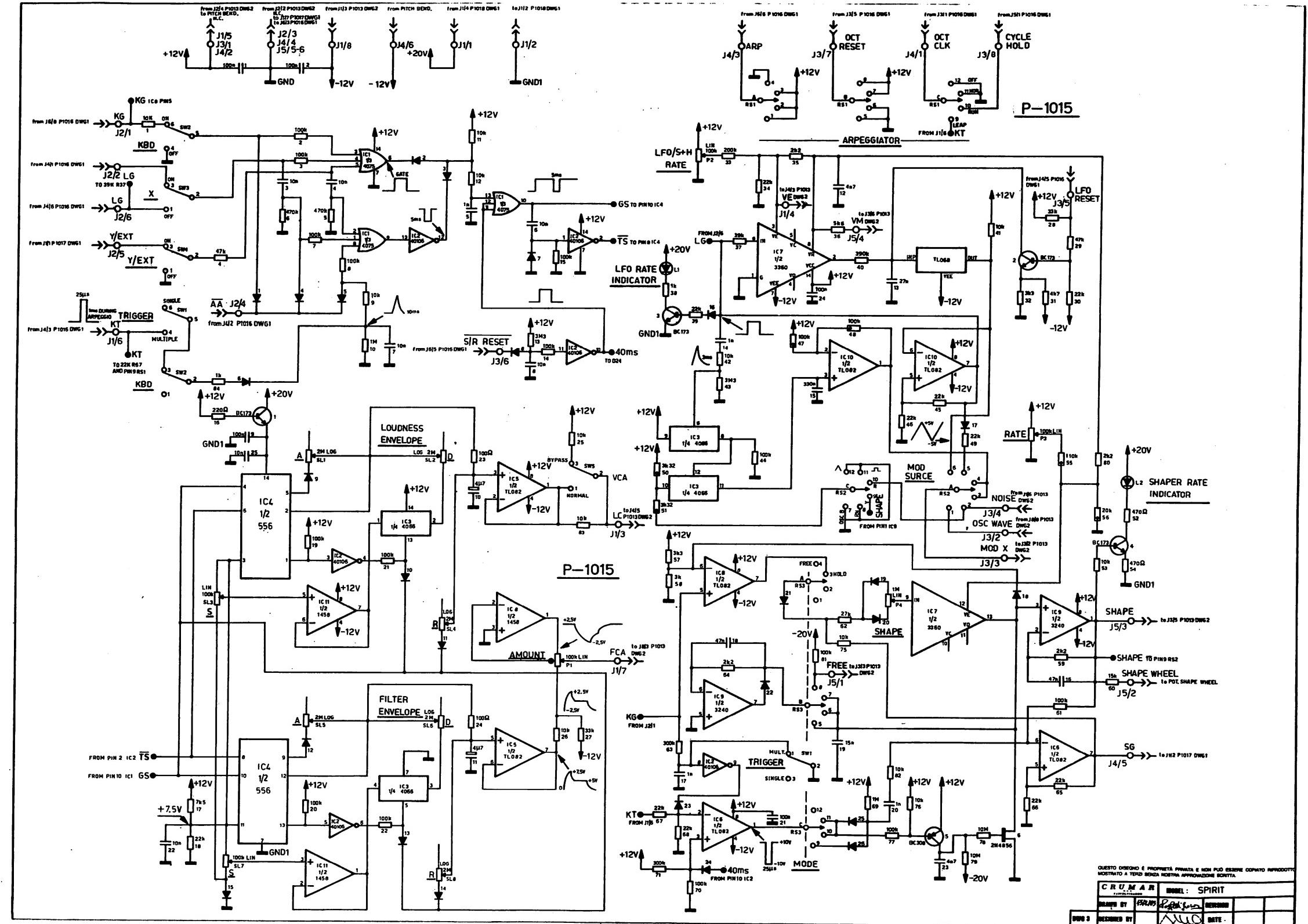
**CRUMAR RESERVES THE RIGHT TO CHANGE  
SPECIFICATIONS AND DESIGNS, WITHOUT  
NOTICE AND LIABILITY.**











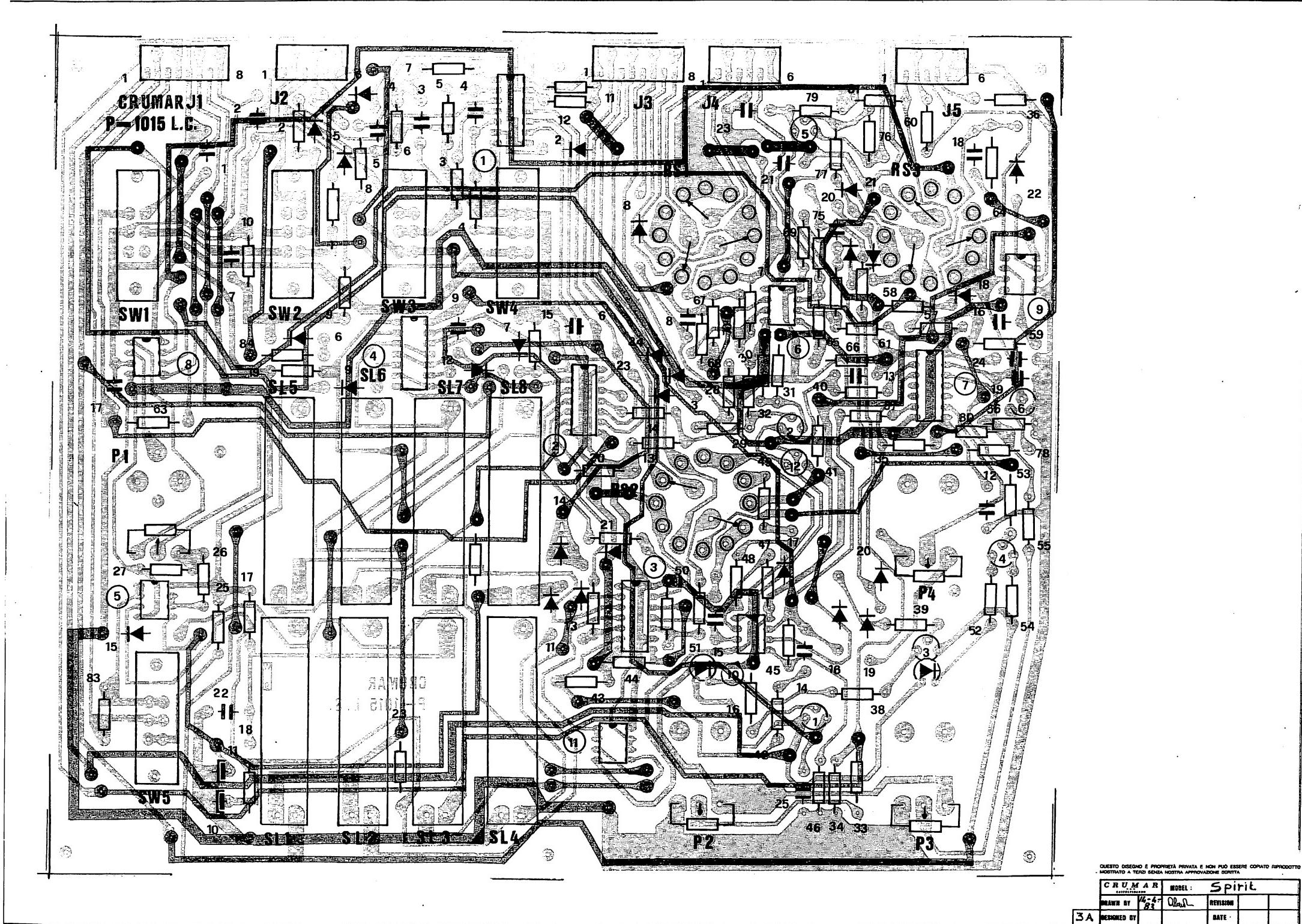
QUESTO DISEGNO È PROPRIETÀ PRIVATA E NON PUÒ ESSERE COPIATO RIPRODOTTO  
MOSTRATO A TERZI SENZA NOSTRA APPROVAZIONE SCRITTA

C R U M A R S P I R I T

PRINTED BY P50495 DATE 10/10/2014

DESIGNED BY P50495 DATE 10/10/2014

REV 3



QUESTO DISEGNO È PROPRIETÀ PRIVATA E NON PUÒ ESSERE COPIATO RIPRODOTTO  
MOSTRATO A TREDÌ SENZA NOSTRA APPROVAZIONE SCRITTA

CRUMAR	MODEL:	Spirit
DRAWN BY	REVISION	
DESIGNED BY	DATE	

## MODEL SPIRIT

## ELECTRONIC COMPONENT LIST

Schem. Ref.	Circuit	Type	Part Code
<b>SEMKO VERSION-POWER SUPPLY (DWG 1)</b>			
P1018/1	Complete with components		978002778
PD1	Rectifier bridge	KBL04	66000006
T68	Trasformer		18010111
<b>CSA VERSION-POWER SUPPLY (DWG 1)</b>			
P1018/1	Complete with components		978002779
PD1	Rectifier bridge	KBL04	66000006
T68	Trasformer		18010112
<b>KEYSWITCHES (DWG 1)</b>			
P1016	Complete with components		978002723
IC1	Hex schmitt trigger	40106	68010193
IC2	Stage binary counter	4024	68010122
IC3-4	Analog. multiplexers	4051	68010154
IC5-9-10	Quad 2 - input "AUD" gate	4081	68000019
IC6	Dual 64 bit static schift register	4517	68010198
IC7	Hex D Flip-Flop	40174	68000054
IC8	D/A converter	DACO800	68070197
IC12-15-18-19	Dual Type D Flip Flop	4013	68010136
IC14	4 bit Full adder	4008	68010196
IC16	Dual Op. Ampl.	1458	68000054
TR1	Transistors	BC308	62210001
TR2	Transistors	2N5437	62110041
TR3-4	Transistors	BC173	62120003
D1÷56	Diodes	BA130	65000001
<b>OUT PUTS BOARDS (DWG 1)</b>			
P1017	Complete with components		978002724
<b>OSCILLATORS BOARD (DWG 2)</b>			
P1014	Complete with components		978002721
IC8-9		3340	68030145
TR3/4/5/6/7	Transistors	BC308	62210001

## MODEL SPIRIT

## ELECTRONIC COMPONENT LIST

Schem. Ref.	Circuit	Type	Part Code
<b>FILTER BOARD (DWG 2)</b>			
P1013	Complete with components		978002720
RT1	Voltage regulator	LM317	62110034
RT2	Voltage regulator	7912	62110037
TR1-2	Transistors	BC173	62120003
IC3	Noise generator	MM5837	68010161
IC4-6-10-15	Dual Op. Ampl.	1458	68000054
IC5-7	Dual O.T.A.	3360	68030192
IC11-13	Dual V.C.F.	3350	68030191
IC 12-14	Dual Op. Ampl.	TL082	68030163
D1÷D6	Diodes	BA130	65000001
<b>MODULATION BOARD (DWG 3)</b>			
P1015	Complete with components		978002722
IC1	Triple 3 input "AND" Gate	4075	68010195
IC2	Hex shmitt trigger	40106	68010193
IC3	Quad analog. switch	4066	68000094
IC4	Dual Timer	556A	68030194
IC5-6-8	Dual Op. Ampl.	TL082	68030163
IC7	Dual O.T.A.	3360	68030192
IC9	Dual Op. Ampl.	3240	68030199
IC10-11	Dual Op. Ampl.	1458	68000054

CT 5B 116

SPIRIT  
ERRATA CORRIGE

DWG 1 P 1016: R 56 = 2K2

DWG 2 P 1013: R 45 = 6K8  
R 188 = 22K

DWG 2 P 1014: TM 5 = 47K

DWG 3 P 1015: D 22 = 1N 4149  
D 18 = 1N 4149  
R 79 = 1M  
IC 7 = ADD. C 10 nF (pin 1, pin 7)  
IC 9 = IT CAN BE TL 082